Draft

Supplement -Addendum to the Remedial Action Report for Area 2

Universal Oil Products Site
East Rutherford, NJ
EPA ID: NJD002005106

Prepared for

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Contents

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Acronyms and Abbreviations

cy	cubic yards
ECA	eastern cap area
ENSR	ENSR Consulting and Engineering
EPA	U.S. Environmental Protection Agency
FB	FB East Rutherford
Honeywell	Honeywell International, Inc.
NJDEP	New Jersey Department of Environmental Protection
NJ Transit	New Jersey Transit
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
ppm	parts per million
RAR	Remedial Action Report
ROD	Record of Decision
UOP	Universal Oil Products, Inc.
VOC	volatile organic compound
WCA	western cap area

SECTION 1

Introduction

This document updates information on remedial work performed in association with Area 2 of the Universal Oil Products (UOP) site in East Rutherford, New Jersey, as part of ongoing compliance with the Comprehensive Environmental Response, Compensation, and Liability Act. The designated areas of concern at the UOP site are shown on Figure 1-1.

Information provided in this Supplement pertains to work performed since the issuance of the *Addendum to the Remedial Action Report* (RAR) *for Area 2 (Lot 2, Block 104)* submitted by CH2M HILL on behalf of Honeywell International Inc. (Honeywell), in 2006. This supplemental document is to be considered in conjunction with the 2006 RAR addendum (CH2M HILL, 2006).

In December 2001, Honeywell entered into a long-term lease agreement for Lot 2, Block 104, with FB East Rutherford (FB), whose intention was to develop the property for commercial purposes. In January 2005, FB removed geotechnically unsuitable material and impervious concrete slabs, installed pilings for structural foundations, imported structural fill, and replaced and extended impervious cover across a majority (87 percent) of the property. The development increased the amount of impervious cover more than fivefold, from an original 2.9 acres.

Throughout the development of Area 2, Honeywell complied with the requirements stipulated in the Administrative Consent Order and the Record of Decision (ROD) for the UOP site. In some instances, further protective measures were implemented.

This document provides information on beneficial reuse of the property; the management of material formerly excavated from Lot 2 of Block 104 that was placed in two temporary onsite cap areas, the eastern cap area (ECA) and the western cap area (WCA) (Figure 1-2); a description of PCB soils removed from the New Jersey Transit (NJ Transit) rail right-of-way; a synopsis of groundwater concentrations in Area 2; and a discussion of vapor intrusion screening for the Lowe's building in East Rutherford.

1.1 Record of Decision

In 1993, the U.S. Environmental Protection Agency (EPA) issued the ROD for operable unit (OU) 1 of the UOP Site (EPA, 1993). The ROD detailed the selected remedy for OU1 to address the uplands soils and leachate. The remedial methods required under the ROD were onsite thermal desorption for highly contaminated soils and placement of those treated soils into an onsite cap, the placement of a soil cover over less-contaminated soils, and implementation of institutional controls. The ROD also required installation of leachate collection trenches and pits, the onsite treatment of collected leachate, and the discharge of the treated effluent to groundwater.

Onsite soils contained elevated concentrations of polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and lead,

and onsite leachate contained elevated concentrations of VOCs. The ROD addressed the principal threats to human health and the environment through treatment of the most highly contaminated materials, while containing the lower-level threats securely onsite and eliminating pathways to exposure.

In 1999, the EPA issued a ROD Amendment (EPA, 1999a) and an Explanation of Significant Differences (EPA, 1999b), describing a modification to the treatment method for soils containing elevated concentrations of VOCs. In the 1993 ROD, those soils were to be treated by thermal desorption; however, owing to problems associated with the thermal desorption system, other treatment options were investigated. The ROD Amendment approved the use of a thermally enhanced soil vapor extraction system to treat the remaining VOC-contaminated soils.

Remedial action for Area 2 as prescribed in the ROD was completed in 2001. The remediation involved removing contaminated soils and sewer sediments and treating and discharging groundwater to Ackermáns Creek (under a permit from the New Jersey Department of Environmental Protection [NJDEP]) (ENSR Consulting and Engineering [ENSR], 1997). Treated soils were placed in an onsite capped area or disposed of offsite in accordance with the ROD. An amended Area 2 RAR was submitted in 2001 that included information on the treatability test performed on VOC–contaminated soils (ENSR, 2001). On November 5, 2004, Honeywell received a letter from NJDEP stating that both NJDEP and EPA considered the remedial activities within Area 2 to have been conducted and completed in accordance with the 1993 ROD.

In order to meet the remediation goals stipulated in the ROD, during the 2005 site development all contaminated soil was removed for offsite disposal and the remaining non-hazardous soil was stockpiled into two temporary onsite cap areas, the ECA and WCA. The ECA and WCA were removed in 2006, and are described in detail below.

Development on Lot 2 is now complete, and Honeywell has submitted a draft deed notice to NJDEP for approval. Once approval from NJDEP is received, the deed notice will be implemented, and all requirements under the ROD for OU1 will be complete.

SECTION 2

Summary of Site Work

2.1 Beneficial Reuse and Development Activities

The site development activities were performed in compliance with the ROD for OU1. The development activities resulted in improved conditions at the site over the minimum conditions stipulated in the ROD. Specifically, the following was accomplished:

- Removal of 14,700 cubic yards of additional soil for offsite disposal and replacement with clean structural fill as a result of the geotechnical and civil engineering needs of the development. This material would have remained capped at the site, pursuant to the 1993 ROD.
- At completion of the development, an additional impervious cover was installed (covering 87 percent of the property) via the addition of a soil cap and asphalt and concrete areas.

A deed restriction will be applied for future property use to restrict the use of the site to commercial purposes, as well restricting future subsurface activities and subjecting such activities to NJDEP approval.

The retail stores opened for business on Area 2 in 2006 and 2007. For further discussion of the development activities and associated soil removal, refer to the 2006 Addendum to the RAR (CH2M HILL, 2006).

2.2 ECA and WCA

The two temporary cap areas (ECA and WCA) were constructed adjacent to the existing permanent cap on Lot 8, Block 105.01 (Figure 1-2). All material from Area 2 that was not identified as hazardous was sent to one of these temporary cap areas pending offsite disposal at a non-hazardous waste landfill.

As a protective measure, the caps were covered with a layer of topsoil and were graded at a slope to promote surface runoff. Hydroseeding was performed to prevent surface erosion. The ECA also contained a stockpile base layer of non-hazardous concrete pieces from the Area 2 excavation.

A total of approximately 41,400 cubic yards of soil were placed in the ECA and WCA.

In 2006, Honeywell contracted directly with Shaw Environmental, Inc. to perform the management, load out, transportation, and disposal of the soils in the temporary cap areas to Subtitle D facilities. CH2M HILL provided full-time oversight of this work. All soils from the ECA and WCA were removed from the site for offsite disposal at Waste Management's G.R.O.W.S. Tullytown landfill in Pennsylvania. The soil load out was conducted over a 10-week period, from August 18 through October 26, 2006. A total of

56,826 tons of material were removed from the cap areas and transported via dump trucks to the landfill.

Once load out activities were completed, the former locations of the ECA and WCA were re-graded and re-seeded in accordance with the *Soil Erosion and Sediment Control Plan* (CH2M HILL, 2005) as approved by the Bergen County Soil Conservation District. All work was conducted safely, and no health and safety incidents occurred during the 10-week period. Dust control measures were appropriately used, and no readings above action levels were observed on the dust meter or photoionization detector throughout the project.

All equipment was removed from the site by November 3, 2006. The removal of the temporary cap areas was the final remedial work performed as part of the closure of OU1.

2.3 Deed Restriction

A deed notice will be filed to restrict the use of Lot 2, Block 104. The deed notice will prohibit any alteration, improvement, or disturbance in, to, or about the property that disturbs any engineering controls, without the express written consent of the NJDEP before starting such activities.

Honeywell submitted a draft deed notice to NJDEP on September 29, 2006. Once approval from NJDEP is received, the deed notice will be implemented and all requirements under the ROD for OU1 will be complete.

2.4 NJ Transit Right-of-Way PCB Soils Removal

Between 2003 and 2005, NJ Transit conducted soil sampling and removal activities in the right-of-way along the Pascack Valley railway in areas in and adjacent to the UOP site. The Pascack Valley line passes through the UOP site, between Area 2 and the Streamlands (Figure 1-2). The work was contracted and managed by NJ Transit. NJ Transit has documented that a total of 3,250 tons of soil containing PCBs between 2 and 5 parts per million (ppm), and 678 tons of soils containing PCBs greater than 50 ppm, were removed from the right-of-way and taken offsite for disposal.

2.5 Groundwater Results

The shallow groundwater at the site has been classified by NJDEP as a Class III-B aquifer, non-potable, and hydraulically connected to a saline surface water body, as documented in a 1996 letter from NJDEP to Honeywell. On April 19, 2005, Honeywell submitted the *Technical Letter Report for Groundwater Sampling and Well Abandonment Activities* discussing results from the last groundwater sampling event conducted in Area 2 prior to redevelopment activities. The report noted that light non-aqueous-phase liquids were not detected in any of the wells or collection points located within Area 2, and that no concentrations of the contaminants of concern (VOCs, metals, and PCBs) exceeded the NJDEP surface water quality standards.

As part of the redevelopment, four groundwater collection points were abandoned on January 25, 2005, and three monitoring wells were abandoned on March 13, 2005. A

detailed description of the groundwater sampling and well abandonment activities was provided in the Addendum to the RAR (CH2M HILL, 2006).

As part of the remedial investigation activities for Area 4 (Streamlands), a groundwater-to-surface water pathway evaluation will be performed. All groundwater activities associated with Area 2 are complete.

2.6 Vapor Intrusion Screening

As requested by EPA, a preliminary vapor intrusion pathway screening was performed for Area 2. The screening focused on post-excavation soil sample results from within the Lowe's building foundation footprint, and a review of the Lowe's design drawings to confirm that a vapor barrier had been installed.

Design drawings of the Lowe's building, documenting the installation of the vapor barrier, are included as an attachment to this Supplement. The foundation consists of 4 inches of crushed stone, overlain by a vapor barrier (6-mil poly) that in turn is overlain by a 7-inch concrete slab.

As discussed in the RAR for Area 2 and the Addendum to the RAR, approximately 50,300 cubic yards (cy) of soil were removed from Area 2 and replaced with over 65,000 cy of material (including a base layer of filter fabric, covered by 2 to 3 feet of stone, overlain by another layer of filter fabric, topped with a layer of recycled concrete aggregate, and covered with a layer of clean fill) during the remedial action for OU1. Post-excavation samples were taken within the Lowe's footprint. Results from four of these samples were used in a preliminary vapor intrusion screening assessment and were compared to the indoor air worker exposure scenario.

The worker exposure scenario is considered the most reasonable maximum exposure scenario for purposes of this evaluation. Potential exposures of patrons of the stores occupying the building would be brief compared with workers. Potential migration from vapor intrusion of VOCs in soil was evaluated using analytical results in bulk soil samples that were converted to indoor air concentrations using equilibrium partitioning. The equilibrium partitioning was performed using the Johnson and Ettinger model version designed for soil concentration data.

Benzene, chlorobenzene, ethylbenzene, and total xylenes were the only volatile constituents detected in soil (concentrations are listed in Table 2-1). The highest concentrations of detected constituents in the soil samples were used to estimate volatilization of VOCs from soil to indoor air. A list of assumptions used in generating the Johnson and Ettinger model are shown in Table 2-2.

Risk-based screening levels were developed for VOCs based on an excess lifetime cancer risk of one in a million (1×10^{-6}) and noncarcinogenic hazard index of 1. Standard default assumptions for a worker exposure scenario, developed by EPA, were used in calculating the screening levels. The risk-based screening levels are presented in Table 2-3.

The modeled concentrations of the VOCs in indoor air were compared with the risk-based screening levels. Results of the comparison indicate that detected constituents did not exceed any of their respective risk-based levels (Table 2-4).

This preliminary screening, coupled with the installation of the vapor barrier in the Lowe's building, provide adequate evidence that the vapor intrusion pathway is not complete in Area 2.

Retail stores have also been constructed in the area to the northeast of the Lowe's. During the construction, soils were excavated to 3 to 4 feet below groundwater surface, and replaced with clean fill. None of the excavated soils were identified as hazardous. The buildings were then constructed as slab on grade, above the clean fill. Groundwater monitoring wells were located in this area in the past, and the last round of sampling prior to the construction indicated non-detect for VOCs and/or no detections above the NJDEP Surface Water Quality Standards.

SECTION 3

Remedial Action Cost Summary

Table 3-1 summarizes the cost of remedial action for all work related to Area 2 of the UOP site. This table incorporates previous remedial work performed, as detailed in the amended RARs (ENSR, 2001 and CH2M HILL, 2006). Previous remedial costs documented by ENSR were current as of 2001.

TABLE 3-1
Remedial Action Cost Summary

Activity	Cost ($)	Year of Cost
Clearing and grubbing	28,000	2000
Construction of access road	41,000	2000
Security	56,000	2000
Groundwater collection system	9,000	2000
Mobilize/operate water treatment plant	18,000	2000
Sewer evaluation	36,000	2000
Excavate process sewers	150,000	2000
Clean/rehabilitate storm sewers	101,000	2000
Install NJDOT twin 48-in. storm sewers	169,000	2000
Excavation of contaminated soil	60,000	2000
Backfill with clean imported fill	90,000	2000
Thermal treatment of PCB/PAH soil	403,000	2000
Thermal treatment of VOC soil	20,000	2000
Place treated soil in cap	13,000	2000
Wastewater tank excavation	7,000	2000
Abandonment of production well no. 1	3,000	2000
Site clearing	5,000	2000
Additional PCB analysis	21,000	2000
Cap construction	275,000	2000
Remedial action report	25,000	2000
Engineering oversight	45,900	2000
Excavation and onsite transportation of material	750,000	2005
Laboratory analysis of excavated material	72,000	2005
Abandonment of temporary collection trenches	19,000	2005

TABLE 3-1
Remedial Action Cost Summary

Activity	Cost ($)	Year of Cost
Construction of temporary cap areas	500,000	2005
Material segregation and load out of material for disposal	184,000	2005
Offsite transportation and disposal of material	669,000	2005
Engineering oversight	95,700	2005
Laboratory analysis for waste characterization purposes	29,000	2006
Management, offsite transportation, and disposal of non-hazardous material	4,900,000	2006
Reimbursement to NJ Transit for rail line PCB soil removal	800,000	2008
Total Remedial Cost	**$ 9,595,000**	

SECTION 4

References

CH2M HILL. 2005. *Soil Erosion and Sediment Control Plan.* April.

CH2M HILL. 2006. *Addendum to the Remedial Action Report for Area 2 (Lot 2, Block 104).*

ENSR. 1997. *Remedial Action Report Area 2 – Block 104, Lot 2, UOP Uplands Site Remediation, East Rutherford, New Jersey.* November.

ENSR. 2001. *Amended Remedial Action Report – Area 2 (Block 104, Lot 2), UOP Uplands Site, East Rutherford, NJ.*

EPA. 1993. *Record of Decision: Universal Oil Products (Chemical Division) EPA ID: NJD002005106 OU1 East Rutherford, NJ* (EPA/ROD/R02-93/206).

EPA. 1999a. *Record of Decision Amendment: Universal Oil Products (Chemical Division)* EPA ID: NJD002005106 OU1 East Rutherford, NJ (EPA/AMD/R02-99/516).

EPA. 1999b. *Explanation of Significant Differences: Universal Oil Products (Chemical Division)* EPA ID: NJD002005106 OU1 East Rutherford, NJ (EPA/ESD/R02-99/122).

Tables

TABLE 2-1
Summary of Post-Excavation Soil Detection Data
Honeywell UOP, East Rutherford, New Jersey

Consitutent	Concentration in Soil (µg/kg)
Benzene	18
Chlorobenzene	41
Ethylbenzene	595
Toluene	1290
Xylene (total)	154

TABLE 2-2
Soil-to-Indoor Air Parameters Used in the Johnson and Ettinger (1991) Model - Industrial Land Use
Honeywell UOP, East Rutherford, New Jersey

Symbol	Parameter	Description	Selected Value	Units	Sources
T_S	Average Soil Temperature		10	°C	Default
L_F	Depth Below Grade to Bottom of Enclosed Space Floor	This is the depth from soil surface to the bottom of the floor in contact with soil	200	cm	Default value in User's Guide for basement (USEPA, 2003). Currently some buildings on-site have basements and basements could be built in the future.
L_t	Depth Below Grade to Top of Contamination	This is the depth from soil surface to the top of VOC-contaminated soil. It represents the depth of a VOC contaminant source in soil, or the "dry zone" between the surface and VOC contaminant source	200	cm	Assumed soil contamination is assumed to be directly beneath basement (USEPA, 2003).
L_b	Depth Below Grade to Bottom of Contamination	This is used to determine the thickness of soil contamination. If a value of zero is used, it will automatically invoke the infinite source model.	0	cm	
h_A	Thickness of Soil Stratum A		200	cm	Thickness of soil stratum A is assumed consistent with average depth to soil contamination at default basement depth.
h_B	Thickness of Soil Stratum B		NA	cm	Not Used
h_C	Thickness of Soil Stratum C		NA	cm	Not Used
	Soil Stratum A SCS Soil Type	Used to estimate soil vapor permeability. A low organic carbon soil (sandy loam) type is assumed to be present under the building	SL	unitless	
k_v	User-defined Soil Vapor Permeability	A parameter associated with convective transport of vapors within the zone of influence of a building. It is related to the size and shape of connected soil pores	NA	cm^2	Not Used - calculated by the model
ρ_b^A	Stratum A Soil Dry Bulk Density		1.62	g/cm^3	Default value for sandy loam soil.
n^A	Stratum A Total Soil Porosity	Used with water-filled porosity to calculate air-filled porosity (see below)	0.387	unitless	Default value for sandy loam soil.
θ_w^A	Stratum A Soil Water-filled porosity	Used with total porosity to calculate air-filled porosity (see below)	0.103	cm^3/cm^3	Default value for sandy loam soil.
foc^A	Stratum A Soil Organic Carbon Fraction		0.002	unitless	Default value for sandy loam soil.
ρ_b^B	Stratum B Soil Dry Bulk Density		NA	g/cm^3	Not Used
n^B	Stratum B Total Soil Porosity	Used with water-filled porosity to calculate air-filled porosity (see below)	NA	unitless	Not Used
θ_w^B	Stratum B Soil Water-filled porosity	Used with total porosity to calculate air-filled porosity (see below)	NA	cm^3/cm^3	Not Used
foc^B	Stratum B Soil Organic Carbon Fraction		NA	unitless	Not Used
ρ_b^C	Stratum C Soil Dry Bulk Density		NA	g/cm^3	Not Used
n^C	Stratum C Total Soil Porosity	Used with water-filled porosity to calculate air-filled porosity (see below)	NA	unitless	Not Used
θ_w^C	Stratum C Soil Water-filled porosity	Used with total porosity to calculate air-filled porosity (see below)	NA	cm^3/cm^3	Not Used
foc^C	Stratum C Soil Organic Carbon Fraction		NA	unitless	Not Used
L_{crack}	Enclosed Space Floor Thickness		10	cm	Default (USEPA, 2003)
Δ_P	Soil-Building Pressure Differential		40	$g/cm\text{-}s^2$	Default value for residential building (USEPA 2003). Conservatively used in the absence of an available commercial/industrial building value.
L_B	Enclosed Space Floor Length		7620	cm	Assumed size of structure is 250 x 250 feet (6,250 square feet), single story, with an 8 foot ceiling. The building is assumed to have a basement.
W_B	Enclosed Space Floor Width		7620	cm	
H_B	Enclosed Space Height		244	cm	
w	Floor-Wall Seam Crack Width	Represents a gap assumed to exist at the junction between the floor and the foundation perimeter. This gap is due to building design or concrete shrinkage. It represents the only route for soil gas intrusion into a building	0.1	cm	Default in the user's guide
ER	Indoor air exchange rate	Building ventilation rate, expressed in units of air changes per hour (ACH)	1	(1/h)	Assumed commercial/industrial air exchange rate for future land use.
AT_C	Averaging Time for Carcinogens		70	yrs	Default value (USEPA, 2004).
AT_{NC}	Averaging Time for Noncarcinogens		25	yrs	Default value (USEPA, 2004).
ED	Exposure Duration		25	yrs	Default value (USEPA, 2004).
EF	Exposure Frequency		250	days/yr	Default value (USEPA, 2004).
TR	Target Risk for Carcinogens	Used to calculate risk-based concentration	NA	unitless	Not Used
THQ	Target Hazard Quotient for Noncarcinogens	Used to calculate risk-based concentration	NA	days/yr	Not Used

TABLE 2-3

Calculation of Screening Levels in Indoor Air - Worker Exposure Scenario

UOP, East Rutherford, New Jersey

EXPOSURE PARAMETERS	UNITS	VALUE
Target cancer risk	TR	1E-06
Target Hazard Quotient	THQ	1
Body weight, adult (kg)	BW	70
Air breathed (m^3/d)	IRA	20
Exposure frequency (d/yr)	EF	250
Exposure duration (yr)	ED	25
Averaging time - carcinogenic (yr)	AT_C	70
Averaging time - noncarcinogenic (yr)	AT_N	25

Consituent	Inhalation Slope Factor (kg-day/mg)	Inhalation RfD (mg/kg-day)	Screening Levels in Air (mg/m^3)			Screening Levels in Air ($\mu g/m^3$)			Final Screening Level in Air ($\mu g/m^3$)	Basis
			Carcinogenic	Noncarcinogenic	Lowest Value	Carcinogenic	Noncarcinogenic	Lowest Value		
Benzene	2.70E-02	8.60E-03	5.3E-04	4.4E-02	5.3E-04	5.3E-01	4.4E+01	5.3E-01	5.3E-01	1E-06 ELCR
Chlorobenzene	NA	1.70E-02	NA	8.7E-02	8.7E-02	NA	8.7E+01	8.7E+01	8.7E+01	HQ=1
Ethylbenzene	NA	2.90E-01	NA	1.5E+00	1.5E+00	NA	1.5E+03	1.5E+03	1.5E+03	HQ=1
Xylene (total)	NA	3.00E-02	NA	1.5E-01	1.5E-01	NA	1.5E+02	1.5E+02	1.5E+02	HQ=1

TABLE 2-4
Comparison of Modeled Indoor Air Concentrations to Risk-Based Criteria
Honeywell UOP, East Rutherford, New Jersey

Constituent	Concentration in Soil (µg/kg)	Modeled Indoor Air Concentration ($\mu g/m^3$)	Worker Exposure Risk-Based Screening Level ($\mu g/m^3$)	Further Evaluation May be Needed?
Benzene	18.40	0.08	0.53	No
Chlorobenzene	41.30	0.04	86.87	No
Ethylbenzene	595.00	0.75	1481.90	No
Xylene (total)	154.00	113.83	153.30	No

Figures

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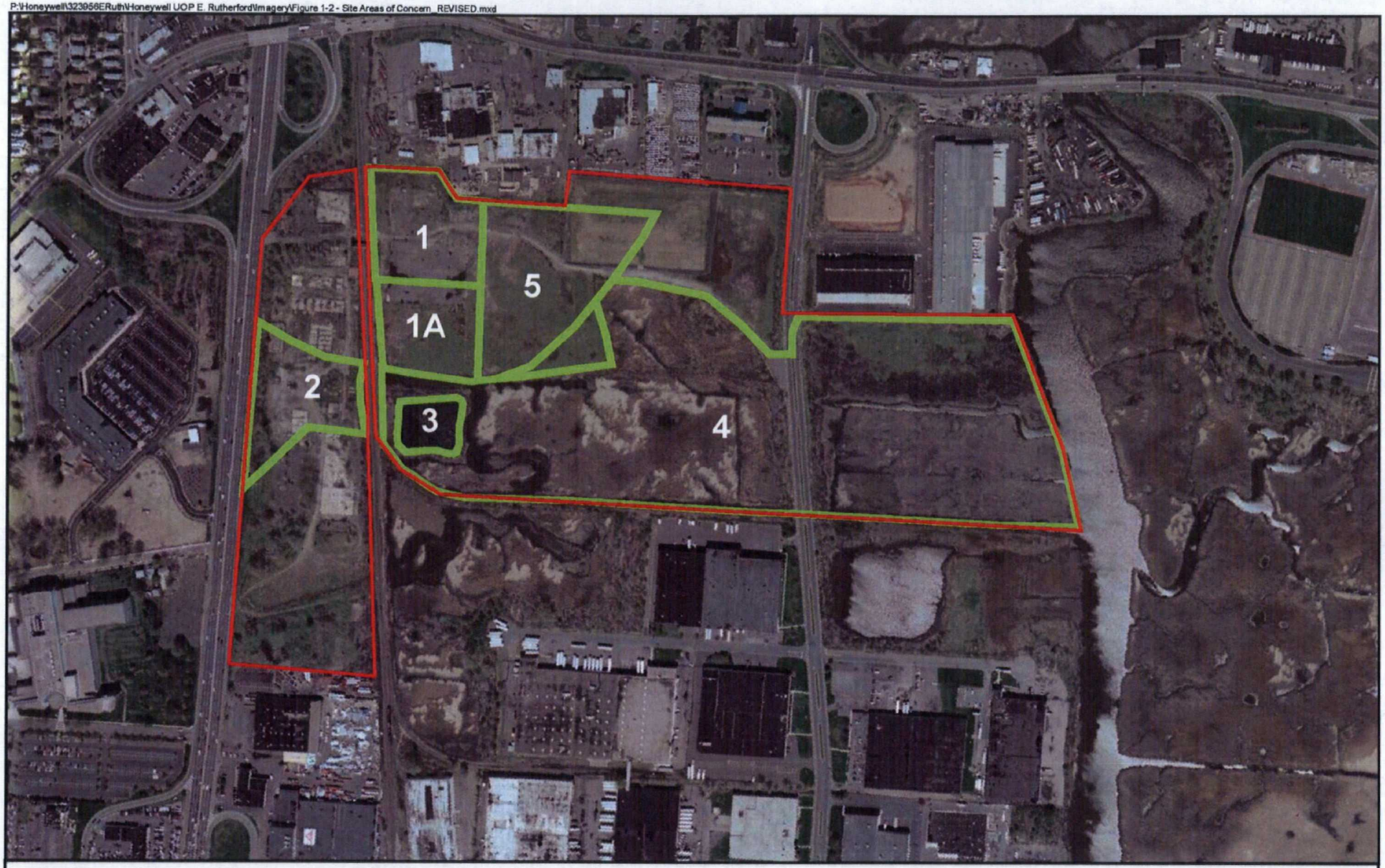

Legend
- Boundary of UOP Site
- Areas of Concern

N
W
E
S

0 500 1,000 Feet

Figure 1-1
Designated Site Areas of Concern
Universal Oil Products (UOP)
East Rutherford, NJ

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Figure 1-2
UOP Site - Former Cap Areas
East Rutherford, NJ

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Attachment

COLUMN SCHEDULE									
		BASE PLATE			ANCHOR BOLTS				
MK#	SIZE	WIDTH	LENGTH	THICKNESS	NUMBER	DIAMETER	LENGTH	EMBEDMENT	PROJECTION
C1	HSS 8 X 8 X 1/4	16.0	16.0	1.000	4	1.00	16.0	11.0	5.0
C2	W8 X 31	8.0	10.0	1.000	4	0.75	16.0	11.0	5.0
C3	HSS 8 X 8 X 1/4	22.0	22.0	1.250	4	1.25	19.0	14.0	5.0
C4	HSS 12 X 8 X 1/4	16.0	16.0	1.000	4	1.00	16.0	11.0	5.0
C5	HSS 12 X 8 X 1/4	16.0	16.0	1.000	4	1.00	16.0	11.0	5.0
C6	HSS 10 X 10 X 3/8	20.0	20.0	1.250	4	1.25	19.0	14.0	5.0

NOTES
1. PIPE COLUMNS ARE ASTM A53 GRADE B (Fy = 35 KSI)
2. TUBE COLUMNS ARE ASTM A500 (Fy = 46 KSI)
3. USE A36 ANCHOR BOLTS WITH WASHERS AND HEAVY HEX NUTS ON BOTH ENDS.
4. BOTTOM OF HEX NUTS TO BE ABOVE REBAR MAT

SPREAD FOOTING SCHEDULE					
MK#	WIDTH	LENGTH	DEPTH	REINFORCEMENT	NOTES
A					
B					
C					
D					
E					
F					

NOTES
1. BOTTOM REBARS ARE LOCATED 3" CLEAR FROM BOTTOM OF FOOTING.
2. TOP REBARS ARE LOCATED 2" CLEAR FROM TOP OF FOOTING.
3. UNITS IN SCHEDULE ARE: WIDTH, DEPTH, LENGTH – FEET.

WALL FOOTING SCHEDULE				
MK#	WIDTH	THICKNESS	CONTINUOUS REINFORCING	TIES/STIRRUPS
W1				
W2				
W3				

MASONRY WALL CONSTRUCTION NOTES

1 ALL EXTERIOR WALLS SHALL BE REINFORCED FULL HEIGHT WITH #8'S AT 24" O.C. THE VERTICAL REBARS SHALL BE DOWELED INTO THE FOOTINGS OR TOPS OF CONCRETE WALLS AS SHOWN AT THE DETAILS.

2 INTERIOR WALLS SHALL BE REINFORCED FULL HEIGHT WITH #4'S AT 48" O.C. THE VERTICAL REBARS SHALL BE DOWELLED INTO THE FOOTINGS AND THE TOPS OF THE WALLS SHALL BE BRACED TO THE ROOF FRAMING AS SHOWN AT THE DETAILS.

3 REINFORCED CORES SHALL BE FILLED SOLID WITH GROUT. SEE SPECIFICATIONS.

4 EXTRA REINFORCEMENT IS REQUIRED ON EACH SIDE OF EACH MASONRY OPENING. REFER TO FOUNDATION PLAN FOR PILASTER MK#'S AND MASONRY PILASTER SCHEDULE FOR NUMBER AND SIZE OF REBAR.

5 PROVIDE (1) EXTRA FULL HEIGHT REBAR ON EACH SIDE OF EACH MASONRY CONTROL JOINT. SEE ARCHITECTURAL PLANS FOR MASONRY CONTROL JOINT LOCATIONS.

6 PROVIDE HORIZONTAL JOINT REINFORCEMENT AT 16" O.C. VERTICALLY IN ALL MASONRY WALLS WITH EXTRA REINFORCEMENT ABOVE AND BELOW EACH OPENING.

7 PROVIDE CONTINUOUS REINFORCED BOND BEAMS AT THE LOCATIONS SHOWN ON THE WALL SECTIONS. THE ROOF FRAMING SHALL BE TIED TO THE WALL AS SHOWN AT THE STRUCTURAL DETAILS.

8 SEE DETAIL 9/S-0.01 AND TYPICAL DETAIL ON DRAWING S-3.0 FOR ADDITIONAL MASONRY REINFORCING REQUIREMENTS FOR SEISMIC PERFORMANCE CATEGORY 'C'.

9 ALL MASONRY WALLS ARE REINFORCED FULL HEIGHT AND SHALL BE LAYED FROM THE INSIDE OF THE BUILDING. SEE ARCHITECTURAL PLANS FOR LOCATION OF MASONRY CONTROL JOINTS IN ALL WALLS. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL TEMPORARY BRACING OF WALL AGAINST WIND LOADING UNTIL ALL STRUCTURAL STEEL IS IN PLACE AND ALL WALL-TO-ROOF CONNECTIONS HAVE BEEN COMPLETED.

FOUNDATION NOTES

THESE NOTES ARE SUPPLEMENTARY TO THE PROJECT SPECIFICATIONS.

1 COMPACTED STONE BASE SHALL BE IN PLACE ON BUILDING PAD, GARDEN CENTER AND CONCRETE APRONS PRIOR TO EXCAVATING PERIMETER OR INTERIOR FOOTINGS.

2 COORDINATE WITH OTHER TRADES FOR REQUIREMENTS AND LOCATIONS OF SLAB PENETRATIONS. (PIPE BOLLARDS, PLUMBING PIPES, ELECTRICAL, STUB-UPS, ETC.)

3 SEE SITE GRADING PLAN FOR SLOPE OF ALL EXTERIOR SLABS.

4 SAW CUT CONTROL JOINTS MAY BE USED IN LIEU OF CONSTRUCTION JOINTS PROVIDED WIDTH OF POUR EQUALS ONE BAY SPACE. MAXIMUM LENGTH OF POUR SHALL BE BASED ON WEATHER CONDITIONS, CONTRACTOR'S CAPABILITIES, AND GOOD CONSTRUCTION PRACTICE.

5 THERE SHALL BE NO VEHICULAR TRAFFIC PERMITTED ON SLAB OR APRONS.

6 ALL BAR REINFORCING SHALL CONFORM TO ASTM A-615, GRADE 60. ALL WIRING OF REINFORCING BARS SHALL BE DONE WITH NO. 16 ANNEALED WIRE.

7 SEE ELECTRICAL DRAWINGS FOR LOCATIONS AND DETAILS OF ELECTRICAL GROUNDING REQUIREMENTS.

8 PROVIDE (2) PIPE GUARD POSTS AT GAS METER AND (2) PIPE GUARD POSTS AT ELECTRICAL TRANSFORMER. SEE SITE PLAN FOR LOCATION OF EACH FOR ADDITIONAL GUARD POST LOCATIONS IN BUILDING. SEE ARCHITECTURAL DRAWINGS FOR DETAILS.

9 GROUT UNDER BASE PLATES SHALL BE "EUCO NS" BY EUCLID CHEMICAL, "FIVE STAR" BY U.S. GROUT, "SONOGROUT G.P." BY SONNEBORNE, OR "MASTERFLOW 713" BY MASTER BUILDERS. GROUT SHALL BE PLACED AT FLUID CONSISTENCY AND EXHIBIT NO VISIBLE BLEEDING TWO HOURS AFTER PLACEMENT. DO NOT VIBRATE GROUT.

ABBR.
M.O. = MASONRY OPENING
–S– = STEP IN WALL FOOTING
B.F.F. = BELOW FINISH FLOOR
F.O.M. = FACE OF MASONRY

CONTROL JOINTS IN CONC. WALL @ 23'-6" o/c. SEE DETAIL 9/S-3.1.

CONTROL JOINTS IN CONC. WALL @ 21'-4"± o/c. SEE DETAIL 9/S-3.1.

RAMP DOWN

REINFORCE PER DETAIL 10/S-3.1

7" CONCRETE SLAB ON 6 MIL-POLY OVER 4" CRUSHED STONE FIN. FLR. EL. 0'-0"

7" CONCRETE SLAB ON 6 MIL-POLY OVER 4" CRUSHED STONE FIN. FLR. EL. -9'-0"

ALL PILES SHALL BE EQUALLY SPACED WITHIN BAYS. NUMBER OF PILES SHALL MATCH WHAT IS SHOWN ON DWGS.

SEE "TYPICAL 7" MAT DETAIL" ON DWG. S-3.0.

DASHED LINES INDICATE LOCATIONS OF CONSTRUCTION JOINTS

DETAIL 12/S-3.2

DETAIL 7/S-3.1

DETAIL 9/S-3.2

1% SLOPE

SLOPE

FROST SLAB

PILASTER SEE DETAIL 7/S-3.2

T.O. PILE CAP & GRADE BEAM ELEVATION ALONG COL. LINE 2 (-1'-4") RELATIVE TO DATUM ELEVATION 0'-0".

DRAINAGE EASMT 45' WIDE

36'-0" WIDE BOX CULVERT BELOW SLAB

FOUNDATION PLAN

SCALE: 1" = 20'-0"

NOTES:
1) SEE TYPICAL DETAIL ON SHEET S-3.0 FOR SLAB REINFORCING.
2) ▱ INDICATES 12" CONCRETE SLAB.
3) TOP OF PILE CAP/GRADE BEAM ELEVATION = -1.00', U.N.O. (....).
4) ○ INDICATES 10"ϕ, 25 TON TIMBER PILE. FOR BIDDING PUPOSES, ASSUME REQUIRED LENGTH OF PILE TO BE FIFTY FEET.
5) ● INDICATES 12"ϕ, 25 TON TIMBER PILE. PORTION OF PILE MUST BE PRE-AUGERED INTO GROUND TO AVOID DAMAGING ADJACENT BOX CULVERTS.

REVISIONS	
◇ PRICHED SET ISSUE DATE	△ POST BID SET ISSUE DATE
DATE	DESCRIPTION
2/15/05	ISSUED FOR PERMIT
3/28/05	ISSUED FOR LOWE'S REVIEW

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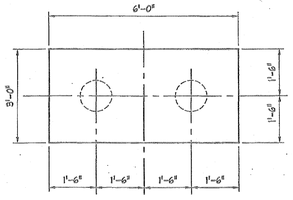
LOWE'S

FOUNDATION PLAN

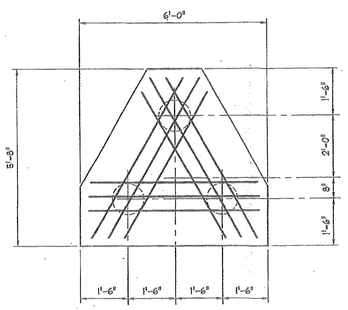
LOWE'S OF
EAST RUTHERFORD
EAST RUTHERFORD, NJ

PROJECT NO: 03.188 DRAWN BY: DWH CHECKED BY: ZUHSH

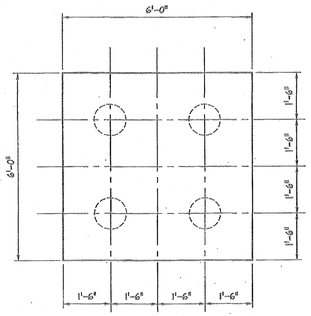
CRITERIA ISSUE DATE:	11.01.04
PERMIT SET ISSUE DATE:	
CONSTRUCTION SET ISSUE DATE:	
DRAWING NUMBER:	S-1.0



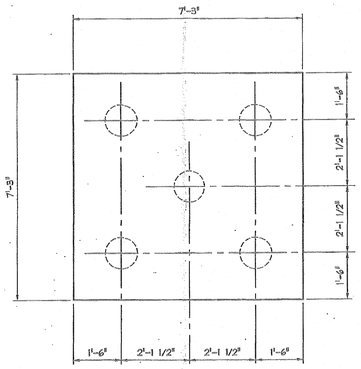
PC2
REINF. - (8) #5 L.W. BOTT.
REINF. - (5) #4 S.W. BOTT.
DEPTH - 34"



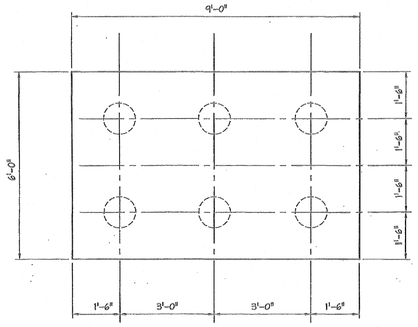
PC3
REINF. - (4) #6 3 WAYS BOTT.
DEPTH - 31"



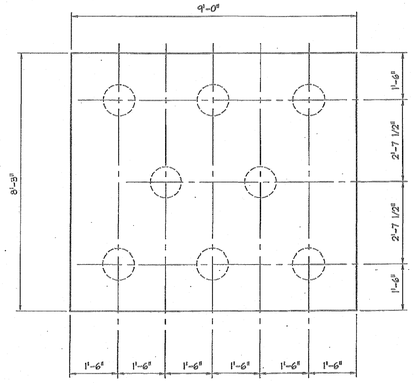
PC4
REINF. - (11) #6 E.W. BOTT.
DEPTH - 31"



PC5
REINF. - (14) #6 E.W. BOTT.
DEPTH - 35"



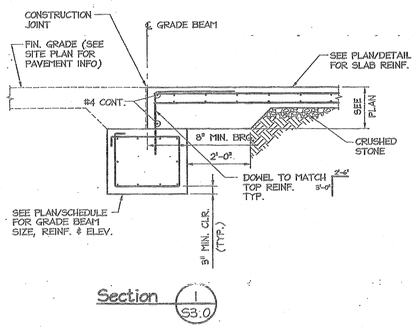
PC6
REINF. - (18) #6 L.W. BOTT.
REINF. - (14) #6 S.W. BOTT.
DEPTH - 44"



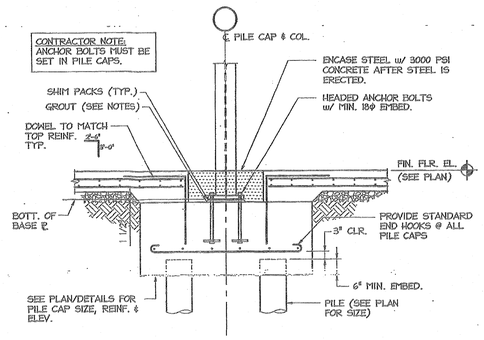
PC8
REINF. - (21) #6 L.W. BOTT.
REINF. - (22) #6 S.W. BOTT.
DEPTH - 54"

PILE CAPS

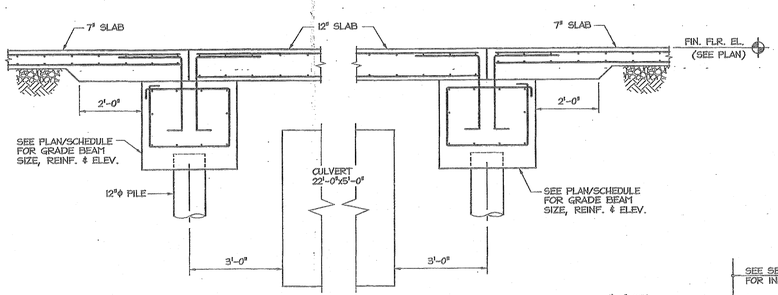
NOTES:
1) ALL BARS MUST BE PROVIDED W/ 180° STANDARD END HOOKS.
2) CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 psi @ 28 DAYS.
3) MINIMUM EDGE DISTANCE TO CENTER OF ALL PILES = 1'-6". MINIMUM PILE SPACING (CENTER TO CENTER) = 3'-0"



Section 1 / S3.0

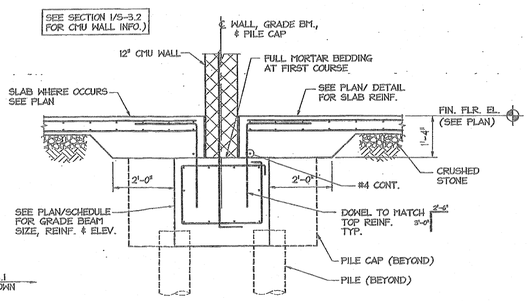


TYPICAL INTERIOR COLUMN ON PILE CAP DETAIL — 2 / S3.0

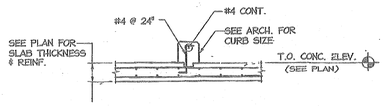


NOTE: ℄ PILE = ℄ GRADE BEAM

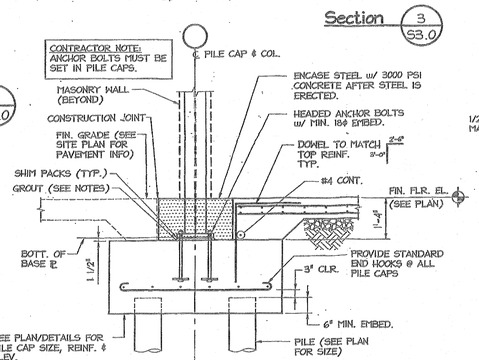
Section 3 / S3.0



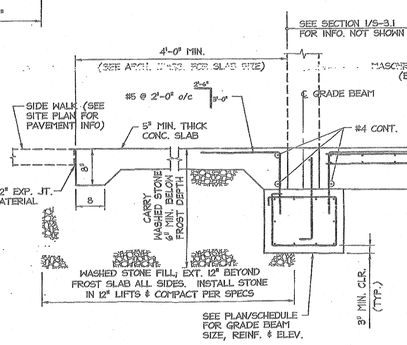
Section 4 / S3.0



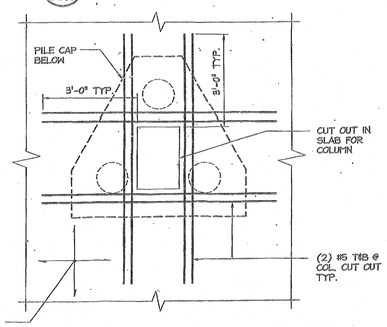
TYPICAL CONCRETE CURB DETAIL



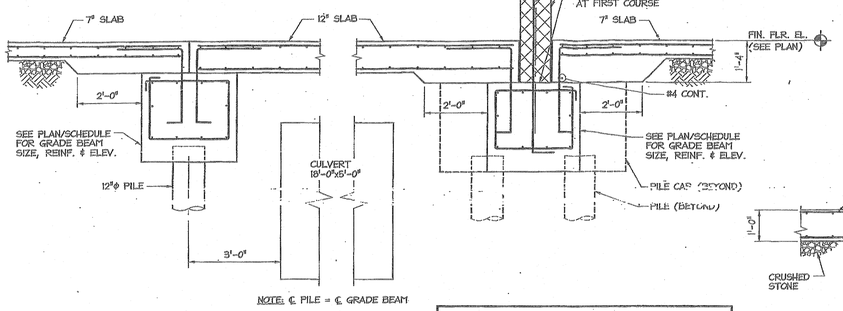
Section 7 / S3.0



Section 6 / S3.0 (ENTRY FROST SLAB)

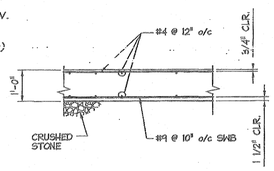


TYPICAL SUPPORTED SLAB DETAIL @ COLUMN CUTOUT



NOTE: ℄ PILE = ℄ GRADE BEAM

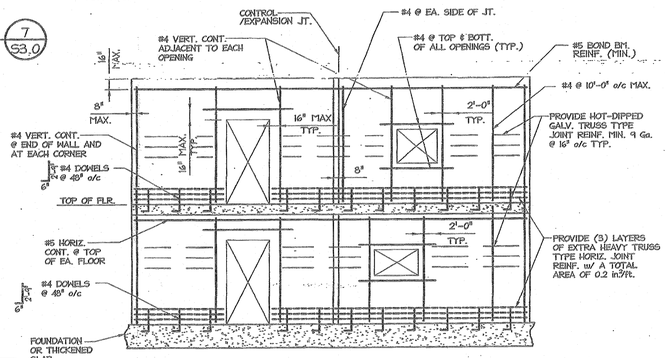
Section 5 / S3.0



TYPICAL 12" ONE-WAY SLAB

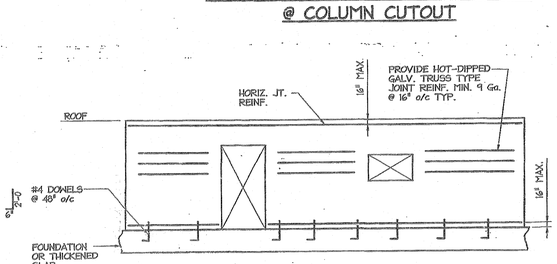
COLUMN SCHEDULE

MARK	SIZE (V50)	BASE PLATE (A36)	A.B. (A36)
C1	HSS 8x8x3/8	1 1/4 x 16 x 1'-4"	(4) 1"ϕ



TYPICAL MINIMUM SEISMIC REINFORCEMENT FOR ALL MASONRY SHEAR WALLS IN SEISMIC PERFORMANCE/DESIGN CATEGORY C

NOTES:
1) ALL VERTICALS ARE TO BE CONTINUOUS FROM FLOOR TO FLOOR.
2) FILL ALL CORES w/REINFORCINGS w/3000 PSI GROUT.
3) THIS IS MIN. REINF. REQUIRED. SEE WALL SECTIONS FOR ADDITIONAL REINFORCING.



TYPICAL MINIMUM SEISMIC REINFORCEMENT FOR ALL MASONRY WALLS

NOTES:
1) FILL ALL CORES w/REINFORCING BARS w/3000 PSI GROUT.
2) THIS IS MIN. REINF. REQUIRED. SEE WALL SECTIONS FOR ADDITIONAL REINFORCING.

LATERAL LOAD DESIGN SCHEDULE
INTERNATIONAL BUILDING CODE (2000)

WIND LOAD			
ITEM	SYMBOL	VALUE	REFERENCE
BASIC WIND SPEED (3 SEC. GUST)	V	100	FIGURE 1609
WIND LOAD IMPORTANCE FACTOR	I_w	1.0	TABLE 1604.5
WIND EXPOSURE CATEGORY	--	B	SECTION 1609.4
SEISMIC LOAD			
ITEM	SYMBOL	VALUE	REFERENCE
IMPORTANCE FACTOR	I_E	1.0	TABLE 1604.5
SHORT PERIOD SPECTRAL ACCELERATION	S_{DS}	0.427g	SECTION 1615.1
(1) SECOND PERIOD SPECTRAL ACCELERATION	S_{D1}	0.151g	SECTION 1615.1
SEISMIC USE GROUP	--	I	SECTION 1616.2
SEISMIC DESIGN CATEGORY	--	C	TABLE 1616.3
SITE CLASSIFICATION	S	D	TABLE 1615.1.1
BASIC STRUCTURAL SYSTEM	--	BUILDING FRAME SYSTEMS	TABLE 1617.6
BASIC SEISMIC-RESISTING SYSTEM	--	REINFORCED MASONRY SHEAR WALLS	TABLE 1617.6
RESPONSE MODIFICATION FACTOR	R	4	TABLE 1617.6
DEFLECTION AMPLIFICATION FACTOR	C_d	2 1/2	TABLE 1617.6
ANALYSIS PROCEDURE		EQUIVALENT LATERAL FORCE PROCEDURE	SECTION 1617.4

DESIGN LOAD SCHEDULE
(ALL LOADS SHOWN ARE IN POUNDS PER SQ. FT.)

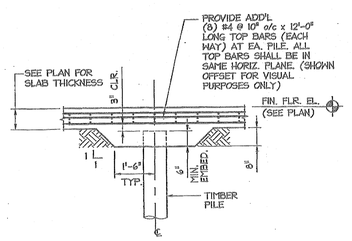
COMPONENT \ AREA	GROUND FLOOR SLAB	TYPICAL ROOF				
CONCRETE SLAB	88					
ROOF & INSULATION		12				
STEEL & JOIST		8				
CEILING		2				
COLLATERAL		3				
TOTAL DEAD LOAD	88	25				
TOTAL LIVE LOAD	150	30				
TOTAL LOAD	238	55				

GRADE BEAM SCHEDULE (f'c=4,000 psi)

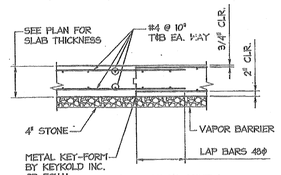
MARK	SIZE b x h	REINFORCING TOP BARS	BOTT. BARS	MID BARS	STIRRUPS EACH END SIZE & SPACING	REMARKS
GB1	42" x 40"	(3) #5	(9) #11	(2) #5 E.F.	#4 @ 7"	
GB2	48" x 40"	(3) #5	(12) #11	(2) #5 E.F.	#4 @ 9"	
GB3	28" x 36"	(3) #5	(7) #9	--	#4 @ 8"	
GB4	28" x 30"	(3) #5	(3) #9	--	#4 @ 8"	
GB5	28" x 36"	(3) #5	(7) #10	--	#4 @ 8"	
GB6	28" x 30"	(3) #5	(5) #9	--	#4 @ 8"	
GB7	48" x 60"	(5) #9	(22) #11	(2) #5 E.F.	#4 @ 6"	
GB8	36" x 30"	(3) #5	(8) #6	--	#4 @ 12"	
GB9	12" WIDE	(2) #4	(2) #4	#4 @ 6" E.F.	#4 @ 12"	

SNOW DESIGN LOAD SCHEDULE
INTERNATIONAL BUILDING CODE (2000)

ITEM	SYMBOL	VALUE	REFERENCE
GROUND SNOW LOAD	P_g	30	FIGURE 1608.2
SNOW EXPOSURE FACTOR	C_e	0.9	TABLE 1608.3.1
SNOW LOAD IMPORTANCE FACTOR	I_s	1.0	TABLE 1604.5
THERMAL FACTOR	C_t	1.0	TABLE 1608.3.2
FLAT-ROOF SNOW LOAD	P_f	20	SECTION 1608.3



TYPICAL SLAB SECTION @ PILE



TYPICAL 7" MAT DETAIL

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REVISIONS
PRE-BID SET ISSUE DATE / POST BID SET ISSUE DATE

DATE	DESCRIPTION
2/15/05	ISSUED FOR PERMIT
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FOUNDATION DETAILS & SCHEDULES

LOWE'S OF EAST RUTHERFORD
EAST RUTHERFORD, NJ

PROJECT No: 03-169 | DRAWN BY: DMM | CHECKED BY: ZJM/EH

CRITERIA
ISSUE DATE: 11.01.04
PERMIT SET
ISSUE DATE:
CONSTRUCTION SET
ISSUE DATE:
DRAWING NUMBER:

S-3.0